CS1007 lecture #8 notes

thu 14 feb 2002 ♡

- news
- `java.lang` package
- looping
- increment/decrement operators
- reading: ch 2.5-2.7,3.5-3.8

news.

- homework #2 is due today
- midterm #1 next thursday (21 feb)

classes.

- *classes* are the block around which Java is organized
- classes are composed of
  - data elements:
    - *variables* — i.e., their values can change during the execution of a program
    - *constants* — i.e., their values CANNOT change during the execution of a program
      - like variables, they have a type, a name and a value
  - *methods*
    - modules that perform actions on the data elements
      - like variables, they have a type, a name and a value
      - unlike variables, the type can be *void*, which means that they don't really have a value
    - *constructors* — special types of methods used to set up an object before it is used for the first time
- groups of related classes are organized into *packages*

the `java.lang` package.

- the superclass for all Java classes, at the top of the hierarchy
  - `java.lang.Object`
- wrappers around primitive data types; classes that define numeric limits and contain conversion methods
  - `java.lang.Boolean`
  - `java.lang.Character`
  - `java.lang.Byte`, `java.lang.Short`, `java.lang.Integer`, `java.lang.Long`, `java.lang.Float`, `java.lang.Double`
- string handling functions
  - `java.lang.String`
- math functions
  - `java.lang.Math`

`java.lang.Integer` class.

- a *constructor:*
```
public Integer( int value );
```
- some *constants:*
```
public static final int MIN_VALUE
public static final int MAX_VALUE
```
- some *methods:*
```
public int intValue();
public static String toString( int i );
public static Integer valueOf( String s );
```


`java.lang.String` class.

- some *constructors:*
```
public String();
public String( String value );
```
- some *methods:*
```
public static String valueOf( int i );
public int charAt( int index );
public int compareTo( String anotherString );
public int length();
```


`java.lang.Math` class.

- some *constants:*
```
public static final double E
public static final double PI
```
- some *methods:*

```
public static int abs( int a );
public static native double sin( double a );
public static native double cos( double a );
public static native double tan( double a );
public static native double pow( double a, double b );
public static native double sqrt( double a );
public static double random();
```


looping.

- if you want to do something many times
- two types of loops:
  - counter controlled
  - condition controlled
- three loop statements:
  - `for`
  - `while`
  - `do`

`for` loop.

```
public class ex8 {
  public static void main ( String[] args ) {
    Integer tmp;
    int     n, i;
    tmp = Integer.valueOf( args[0] ); // String -> Integer
    n = tmp.intValue();               // Integer -> int
    System.out.println( "counting up to " + n + "..." );
    for ( i=0; i<n; i++ ) {
      System.out.print( i+ "  " );
    } // end for
    System.out.println();
  } // end of main
} // end of class ex8
```


increment and decrement operators.

- increment: ++
  `i++;`
  is the same as:
  `i = i + 1;`

- decrement: --
  `i--;`
  is the same as:
  `i = i - 1;`